the west coast of Waygats Island a collection many times richer in species than its predecessors. But in any case it was impossible that the collections which were made during a single summer could be taken as giving so complete an idea of animal life in these regions, as is necessary not only for comparison with the existing fauna of other arctic countries, but also for a complete clearing up of its relation to the fauna in the deposits of the Siberian tundra. It was on this account that I made provision for Dr. Stuxberg accompanying this summer's expedition to Jenissej, and carrying on the zoological work. His researches were rewarded with great success, as appears from the short sketch annexed, communicated by him :—

"During the voyages of 1875 and 1876 to Jenissei and back dredging has been carried on at fifty places in all and at different depths from the beach to a depth of 200 fathoms, and rich and comprehensive animal collections have thus been made. A large proportion of species occur locally, and in quite incredible numbers. Others again are found nearly at every dredging, but in far smaller numbers. The occurrence of the latter is more uniform, consequently distinctive of the territory of the fauna in its entirety. To these belong first of all two species of the genus Idothea (*Id. sabinei* and *Id. entomon*), both well-developed, and it may with reason be said that this genus is characteristic of the Kara Sea ; it is the province of the Idotheæ. To the animal forms again which are local in their occurrence belong various species of Mollusca, Hydromedusæ, and Bryozoa, but chiefly all the representatives of the Echinodermata are known to exist here. The abundance of these is sometimes quite surprising, and, what is more singular, where a species occurs in any great quantity, it lives nearly alone, and to the exclusion of all others. This, for instance, is the case with species of the genera Cribella, Stichaster, Ctenodiscus, &c., which here are found in large and well-developed types. Not seldom the swab brought up at the same time hundreds of the same species. Of the beautiful Crinoid *Alecto Eschrichtii* there were obtained many choice specimens.

"But rich as is the Kara Sea in asterids and ophiurids, it is proportionately poor in echini. These have been sought for everywhere without success, except possibly close to the east coast of Novaya Zemlya. This circumstance is the more extraordinary as along the whole of the west coast a species of the family Echinus is one of the animal forms that are most abundant and occur most frequently.

"In two respects the zoological work of this summer has been exceedingly profitable for our museums. It has in the first place added something new in all the groups to the very rich collections made during last summer ; it has, for instance, increased the collection of crustacea by 20 per cent. new species, and of echinodermata a large number of types has by oft-repeated swabbing been obtained in an extraordinary collection of specimens. Further, the swab has brought up from the bottom of the Kara Sea two animals specially remarkable and important in a systematic respect. The first was brought up by the swab during last year's expedition, not far from the eastern mouth of Matotschkin Scharr. Then it was found in only a few specimens, now we have collected a considerable number. It is a hitherto unknown holothurioid, differing greatly from most others of the same group by its quite complete bilateral symmetry, but from all by its habitus and anatomical structure, and being singular in its kind inasmuch as it combines characters from diverse classes of animals. It has lately been exhaustively described and delineated in detail by its first discoverer, Dr. Théel. The other remarkable animal is one of the greatest rarities within the animal world. It is an Umbellularia[1] of about a foot and a half in length. It was found in 150 fathoms south of Cape Middendorff, and north of the 75th degree of N. lat.

"From the collections made during the Swedish expeditions it appears that the Kara Sea, far from being so poor as has been supposed, is, on the contrary, distinguished by an animal life rich both in individuals and in types when compared with that which Spitzbergen, Greenland, Iceland, and the Arctic regions of North America have to show. It appears, also, that a nearly uniform marine fauna is found around the pole along the whole coast of Siberia and the polar archipelago of North America. The immense mass of fresh-water which the great rivers of Siberia carry down, does not in any degree determine the composition of the animal life on the bottom of its Arctic Ocean.

"Before the various groups have been worked out by specialists it is difficult to state for certain the number of the lower animal types of the Kara Sea, but it may be put approximately at nearly 500 species, a considerable number, indeed, for a sea that previously was believed to be as poor in species as the Baltic. Such, with the addition of about a hundred species of insects from Novaya Zemlya, whence previously only seven were known, and an extended knowledge of the vertebrate world, is the main zoological result of the researches of the last two Swedish expeditions in these regions."

The *Ymer* made a safe return voyage through Matotschkin Scharr, and on September 18 anchored at Hammerfest. Dr. Nordenskjöld concludes :—

"My stay at Hammerfest and Tromsö I turned to account in collecting information from the numerous walrus-hunters there about the state of the ice in the Arctic regions, and especially in the Kara Sea. I have succeeded in this way in bringing together very abundant materials for a solution, founded on actual observations, of the problem in navigation which lies before us here, and I shall, by and by, make a full statement of the conclusions at which I have thus arrived. Here I will only say that it is my conviction, which is also shared by the walrus-hunters whom I have consulted, that a regular sea-communication between Siberia and Northern Europe during a short season of the year ought not to be attended with greater risks and dangers than seamen encounter on many other waters now yearly visited by thousands of vessels."

OUR ASTRONOMICAL COLUMN

TELESCOPIC METEORS.—In his "Histoire de l'Astronomie pour l'Année VIII.," Lalande, referring to Schröter's observations, states, "il a vu plusieurs fois dans son telescope des petites étoiles qui filent comme un petit trait de lumière très-faible, qui dure 2 ou 3^s," and by way of explanation goes on to say that this proves the extension of hydrogen and oxygen many leagues in the depth of the atmosphere ; meteors or globes of fire which excite astonishment when they are a distance of some hundred *toises*, become shooting stars when they are distant a league, and telescopic stars at three or four leagues, an opinion hardly favoured by later research.

When occupied in comet-sweeping, or general observation in a dark and pretty large field, it has very often occurred to the writer to meet with objects of the class mentioned by Lalande. A striking instance was afforded one very fine April morning about twenty-seven years since (the exact date, though upon record is not at hand at this moment), when a number of telescopic meteors as bright as stars of the eleventh magnitude passed slowly through the field at intervals of a minute or more, the instrument during the time of observation being directed to different parts of the constellation Sagittarius and lower region of Ophiuchus ; the course of these meteors was nearly uniform. Their motion was generally so slow that when caught they could be followed to extinction on moving the instrument. On other occasions he had noticed similar slow-moving meteors, though in less number, and hence was under the impression that there was nothing unusual in the occurrence. But in the summer of 1850, happening to mention the observations of frequent faint slow-moving telescopic meteors to Sir John Herschel, that eminent observer, notwithstanding his long experience in both

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[1] Two specimens of the family Umbellularia, the first of which we have any knowledge, are said to have been found on the coast of Greenland before the middle of last century. After a description first given by Ellis and Mylius, the animal was registered by Linnæus in his "Systema Naturæ," in the year 1758, under the name *Isis encrinus*. What has become of the original specimen is unknown. The enigmatical animal type, as it appeared from the descriptions, has been the subject of many interpretations, till Dr. J. Lindahl, during the Swedish expedition to Greenland in 1871, succeeded in dredging up two specimens of it in Baffin's Bay, and accurately described its interior structure in the *Transactions* of the Academy of Sciences. Individuals of the same genus have since been found, first by the English *Challenger* Expedition in 1873, between Portugal and Madeira, by the same expedition between Prince Edward's Island and Kerguelen's Land, and possibly at other places in the Antarctic Ocean ; afterwards by the Austro-Hungarian expedition in 1873, between Novaya Zemlya and Franz Josef Land (the specimen was lost when the *Tegetthoff* was abandoned) ; again during the present summer by the Norwegian Atlantic expedition off the west coast of Norway, and finally by us in the Kara Sea. It is thus an animal type which is widely distributed, but of extremely rare occurrence.

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hemispheres, expressed surprise at the phenomenon, and stated that he did not recollect to have remarked anything of the kind. In 1852 Schmidt published the results of his observations of telescopic meteors between 1844–51, "Resultate aus zehnjahrigen Beobachtungen über Sternschnuppen," p. 165; most of those seen by him were as bright as stars of between the eighth and tenth magnitudes, and generally moved very slowly. Schmidt during these observations was for the most part using a "comet-seeker," the same with which he formed the chart for Hour V. of R.A. in the Berlin series; the writer was invariably observing with the comet-eyepiece on a 7-inch refractor giving a power of about 45.

Perhaps some of the astronomical readers of NATURE may be able to put upon record the dates of other appearances of telescopic meteors in some numbers and with a general uniformity of direction.

Lalande appears to make his reference to Schröter's observation of telescopic meteors with the intention of illustrating the acuteness of vision of the Lilienthal astronomer. Indeed, in the preceding sentence he makes the following extraordinary statement with regard to Schröter:—"Il a une vue privilegiée pour l'astronomie; il voit Mercure en plein jour à la vue simple."

THE COMET OF THE BAYEUX TAPESTRY.—There can now remain very little doubt that the grand comet which astonished Europe in the year of the Norman Conquest leading to a multitude of records in the annals of the time, and forming, with its astonished beholders, the subject of embroidery on the celebrated Bayeux tapestry, was the famous body which now bears universally the name of our countryman Halley. Allowing for the peculiar character of Chinese observations of comets, the account they have left us of its track amongst the stars from the beginning of April to the end of the first week in June, 1066, is well represented by elements not differing more from the actual elements of Halley's comet than accumulated effect of perturbation in eight centuries may well explain. If it is assumed that Halley's comet arrived at its least distance from the sun on March 18, its position when discovered by the Chinese in the morning sky on April 2, would be as they record in their sidereal division "Shih," two degrees south of the equator, and distant from the earth rather less than eight-tenths of the earth's mean distance from the sun. Between this date and June 8, or sixty-seven days after discovery, which is the duration of visibility assigned, the comet would make a grand sweep across the sky from the constellation Pegasus into Sextans between Leo and Hydra, or as the Chinese express it, "through fourteen sidereal divisions from Shih to Chang." The imposing aspect of the comet described in European chronicles and confirmed by the Chinese Annals, wherein it is compared in brilliancy to Venus, and by exaggeration, no doubt, even to the moon, is fully explained by the cicumstances under which Halley's comet must have been observed if in perihelion on March 18. When last seen in China it had receded to 1¾ times the earth's distance from the sun.

METEOROLOGICAL NOTES

RECENT STORMS.—We have already referred to the great cyclone of October 31, which will long be remembered as one of the most appalling catastrophes that has occurred in the history of the human race. The storm-wave advanced over Chittagong from south to north, but most of the damage was done along the shores of the Meghna by a storm-wave which swept seawards from north to south. The details of this and the other features of this great cyclone will be looked forward to with intense interest.—We have also given some account of the storm of wind of almost unexampled violence which broke over Sydney at 9.50 P.M. of Sunday, September 10, and continued with unabated fury during the whole of Monday. Since as there are good reasons for the belief that the maximum velocity or force of the wind in great storms is frequently understated, it is desirable that the fullest details of the observations from which the velocity of the wind at the rate of 153 miles an hour has been deduced be published in the monthly publication of the Observatory.—A hurricane of great severity and followed by most disastrous results swept over Central America on October 3 and 4. The town of Managua, on the south side of the lake of the same name, and west of Lake Nicaragua, was inundated on the 4th, and 400 houses were blown down by the hurricane. As the flood rose the inhabitants had to betake themselves to the tops of the houses, and many were drowned by the houses falling. The hurricane then passed eastward over Lake Nicaragua and descended over Blewfield, situated on the Mosquito Gulf, and overturned upwards of 300 houses in that town. It was in all probability the same cyclone which was encountered at the same date by the Panama Transit and Pacific Mail Steamer *Costa Rica* about 300 miles to the south-east, near Parita, on the Gulf of Panama, where it was accompanied with a frightful sea-running wind shifting all round the compass and blowing with such a force that the *Costa Rica* had its hurricane deck blown away and the head of the mainmast, maintopmast, and gaff carried off. Later, or from October 17 to 21, Capt. Bremner, of the steamship *Chilian*, reports the severest hurricane he ever experienced at Cayman's Island, to the west of Jamaica, where 170 houses were destroyed and much damage done to fruit trees and other crops.—The list of heavy storms and hurricanes might be increased by including the severe storms reported as having recently occurred in Behring's Strait, wrecking a dozen of whalers, the great gale near Chefoo, in which H.M.S. *Lapwing* was lost, the terrible storms in Madeira and Portugal, commencing on November 11, and the storms of the British Islands a fortnight since, as well as during the present week, with their attendant floods, which in certain districts attained to a height and a destructiveness unknown for many years. The last two months have thus been noteworthy for the violence of the storms of wind which have been let loose, as it were, over all quarters of the globe, thus offering in their salient weather characteristics a marked contrast to the characteristics of the weather little more than a year ago, when we were called to record disastrous inundations occurring in almost all parts of the globe. During the past two months the weather has not only been characterised by the extreme violence of the wind but also by equally unprecedented and violent alternations of abnormally warm and cold, and dry and wet tracks of weather —the connection between which is no doubt a more deeply rooted one than that of mere coincidence.

METEOROLOGICAL OBSERVATORY ON MONTE CAVO.—We are interested to learn, from a letter which appears in *Comptes Rendus*, that P. Secchi has succeeded in establishing a meteorological observatory on the summit of Monte Cavo. This is the highest of the volcanic group in Latium. Its summit rises 953 metres above the sea-level and about 900 metres above the Roman Campagna. The meteorological instruments are placed in the convent, and the monks are charged to make observations. These instruments are a Fortin barometer, a psychrometric thermometer, a maximum and minimum thermometrograph, a pluviometer, and a weather vane. An anemometrograph will soon be added. The isolation of the mountain, which rises about 200 metres above the surrounding volcanic cones, renders it peculiarly well suited for researches in meteorology. In view of the importance of the institution the Government has agreed to defray the expense of installation. The observations are only begun two months; they show, among other things, that the temperature of Monte Cavo is often higher than that of Rome, and that the variations of temperature are less than on the plain. There is another observatory at the base of the cone, at Grotta-Ferrata, in a monastery there also; its elevation is about 330 metres, and it

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